

WHAT IS CLAIMED IS:

1. A personal authentication system comprising:
  - a first electrode that is disposed in a first skin area of a person to be authenticated;
  - a second electrode that is disposed in a second skin area apart from the first skin area, the contact surface between the second electrode and the second skin area having a predetermined area such that the resistance of the epidermis in the second skin area becomes substantially zero when an electric potential is generated between the first electrode and the second electrode;
  - a measuring unit for measuring the resistance distribution of the epidermis in the first skin area based on a predetermined voltage that is applied between the first electrode and the second electrode and a current flowing between the first electrode and the second electrode through the body, including the skin, of the person to be authenticated; and
  - an authentication unit that stores the resistance distribution data, which is measured in advance, of the epidermis in the first skin area of a validated person, for comparing the resistance distribution data of the epidermis in the first skin area of the person to be authenticated, the resistance distribution being measured with the

measuring unit, with at least part of the stored resistance distribution data of the epidermis of the validated person to validate the person to be authenticated.

2. A personal authentication system according to Claim 1,

wherein the contact surface between the first electrode and the first skin area has a predetermined area such that the resistance of the epidermis in the first skin area does not substantially vary when an electric potential is generated between the first electrode and the second electrode.

3. A personal authentication system according to Claim 1,

wherein the distance between the first electrode and the second electrode is longer than a distance in a case in which electrical leakage begins to occur between the first electrode and the second electrode through skin upon generation of an electric potential between the first electrode and the second electrode.

4. A personal authentication system according to Claim 1,

wherein first electrodes are disposed on a plurality of

fingers of the person to be authenticated, and

wherein the measuring unit measures the resistance distribution of the epidermis on the plurality of fingers to identify the positions in the hand of the person to be authenticated based on the resistance distribution on the epidermis near the joints of the fingers.

5. A personal authentication system according to Claim 1,

wherein the measuring unit measures the two-dimensional resistance distribution of the epidermis in the first skin area to determine the patterns on the surface in the first skin area based on the measured two-dimensional resistance distribution.

6. A personal authentication system according to Claim 1,

wherein the second electrode is a plane electrode.

7. A personal authentication method comprising the steps of:

measuring the resistance distribution of the epidermis in a first skin area, based on a voltage that is applied between a first electrode that is disposed in the first skin area of a person to be authenticated and a second electrode

that is disposed in a second skin area apart from the first skin area, the contact surface between the second electrode and the second skin area having a predetermined area such that the resistance of the epidermis in the second skin area becomes substantially zero when an electric potential is generated between the first electrode and the second electrode, and a current flowing between the first electrode and the second electrode through the body, including the skin, of the person to be authenticated; and

comparing the resistance distribution data of the epidermis in the first skin area of the person to be authenticated, the resistance distribution being measured with the measuring unit, with at least part of the resistance distribution data, which is measured in advance, of the epidermis of a validated person to validate the person to be authenticated.

8. A personal authentication system comprising:

a first electrode that is disposed in a first skin area of a person to be authenticated;

a second electrode that is disposed in a second skin area apart from the first skin area and has a sufficiently larger area than the first electrode;

a measuring unit for measuring the resistance distribution of the epidermis in the first skin area based

on a predetermined voltage that is applied between the first electrode and the second electrode and a current flowing between the first electrode and the second electrode through the body, including the skin, of the person to be authenticated; and

an authentication unit for comparing the measured resistance distribution with at least part of the resistance distribution data of the epidermis of a validated person, who is registered in advance, to validate the person to be authenticated.

9. A personal authentication system according to Claim 8,  
wherein the second electrode is a plane electrode.